Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-21. (Canceled)

22. (Currently amended) An electrostatically-actuated diffractive optical processor having a substrate, and an axis normal to at least a portion of a surface of the substrate comprising:

a plurality of first mirror surfaces, each having two ends, at least a portion of each of the plurality of first mirror surfaces normal to the direction of the axis, and each suspended over the substrate and displaceable in the direction of the axis;

a plurality of supports each coupled to at least a corresponding one of the plurality of first mirror surfaces at a point intermediate the ends of the corresponding one of the plurality of first mirror surfaces;

a plurality of actuation beams, each of the plurality of actuation beams suspended over the substrate to form a corresponding actuation gap, each of the plurality of actuation beams coupled to at least one of the plurality of supports to suspend a corresponding one of the plurality of first mirror surfaces over the substrate, each of the plurality of actuation beams including an actuation region displaceable through the corresponding actuation gap;

a plurality of second mirror surfaces, at least a portion of each of the plurality of second mirror surfaces normal to the direction of the axis, each of the plurality of second mirror surfaces optically adjacent to at least a corresponding one of the plurality of first mirror surfaces for light projected parallel to the axis, each of the plurality of second mirror surfaces separated from the corresponding one of the plurality of first mirror surfaces by a corresponding distance in the direction of the axis; and

a plurality of electrodes, each coupled to ~~provided on~~ the substrate and corresponding to one of the plurality of actuation beams;

wherein when a voltage is applied between one of the plurality of actuation beams and the corresponding one of the plurality of electrodes, the actuation region is displaced through the corresponding actuation gap, the corresponding first mirror element is displaced, and the corresponding distance is changed.

23. (Currently amended) The diffractive optical processor of claim 22, wherein each of the plurality of first mirror surfaces is coupled at the ends, and further wherein the optical processor is configured such that, when one of the plurality of first mirror surfaces is displaced in the direction of the axis such that the corresponding distance is changed, the one of the plurality of first mirror surfaces exhibits a curvature which is caused to be altered by a corresponding at least one of the plurality of supports.

24. (Currently amended) The diffractive optical processor of claim 22, wherein ~~the curvature of~~ the optical processor is configured such that, when one of the plurality of first mirror surfaces is displaced in the direction of the axis, the one of the plurality of first mirror surfaces is caused to be substantially planar in a region about its point intermediate the ends by a ~~the~~ corresponding at least one of the plurality of supports.

25. (Original) The diffractive optical processor of claim 22, further comprising a plurality of mirror beams each having a top surface, each of the plurality of mirror beams suspending a corresponding one of the plurality of second mirror surfaces above the substrate and each forming a corresponding beam gap.

26. (Original) The diffractive optical processor of claim 25, wherein each of the plurality of second mirror surfaces covers the width of the top surface of a corresponding one of the plurality of mirror beams from edge to edge.

27. (Currently amended) The diffractive optical processor of claim 25 ~~26~~, wherein each of the plurality of mirror beams suspends a corresponding one of the second mirror surfaces a fixed distance above the substrate.

28. (Original) The diffractive optical processor of claim 25, wherein at least one of the plurality of actuation beams is coupled to two neighboring mirror beams of the plurality mirror beams, and wherein the at least one actuation beam is suspended above the substrate by the two neighboring mirror beams.

29. (Currently amended) The diffractive optical processor of claim 22, wherein the widths of each of the plurality of first mirror surfaces is equal to the widths of each of the plurality of second mirror surfaces.

30. (Currently amended) The diffractive optical processor of claim 22, wherein the widths of at least some ~~each~~ of the plurality of second mirror surfaces is larger than the widths of each of the plurality of first mirror surfaces.

31. (Currently amended) The diffractive optical processor of claim 22, further comprising a controller electrically coupled to the plurality of electrodes ~~diffractive optical processor~~ adapted to control ~~for controlling~~ the displacement of the plurality of first mirror surfaces.

32. (Currently amended) The diffractive optical processor of claim 22, further comprising processing circuitry integrated on the substrate and electrically coupled to the plurality of electrodes~~,~~ so as to control the displacement of the plurality of first mirror surfaces.

33-41. (Canceled)

42. (New) The diffractive optical processor of claim 22, wherein the diffractive optical processor has a top surface, and wherein the optical processor is configured and arranged such

that, when light is projected parallel to the axis, at least some of the light impinges on the diffractive optical processor substantially normal to the top surface.

43. (New) The diffractive optical processor of claim 22, further comprising a frame coupled to the ends of each of the plurality of first mirror surfaces.

44. (New) The diffractive optical processor of claim 25, wherein each of the plurality of mirror beams is actuatable.

45. (New) The diffractive optical processor of claim 22, in a combination with a demultiplexer adapted to separate a wavelength division multiplexed signal into a plurality of sub-signals, wherein the diffractive optical processor is optically coupled to the demultiplexer to receive and diffract at least one of the plurality of sub-signals.

46. (New) The combination of claim 45, wherein the diffractive optical processor has a top surface, and wherein at least one of the sub-signals impinges on the diffractive optical processor substantially normal to the top surface.

47. (New) The combination of claim 45, wherein the demultiplexer is a diffractive demultiplexer.

48. (New) The combination of claim 45, further comprising a controller electrically coupled to the plurality of electrodes, wherein the combination is configured to operate as a gain equalization filter.

49. (New) The combination of claim 45, further comprising a controller electrically coupled to the plurality of electrodes, wherein the combination is configured to operate as a variable optical attenuator.

50. (New) The combination of claim 45, further comprising a controller electrically coupled to the plurality of electrodes, wherein the combination is configured to operate to add a sub-signal to a main pathway.

51. (New) The combination of claim 45, further comprising a controller electrically coupled to the diffractive optical processor, wherein the combination is configured to operate to drop one of the sub-signals from a main pathway.

52. (New) A method of processing light, comprising:

providing an electrostatically-actuated diffractive optical processor having a substrate, and an axis normal to at least a portion of a surface of the substrate comprising (i.) a plurality of first mirror surfaces, each having two ends, at least a portion of each of the plurality first mirror surfaces normal to the direction of the axis, and each suspended over the substrate and displaceable in the direction of the axis, (ii) a plurality of supports each coupled to a corresponding one of the plurality of first mirror surfaces at a point intermediate the ends of the corresponding one of the plurality of first mirror surfaces, and (iii) a plurality of second mirror surfaces, at least a portion of each of the plurality of second mirror surfaces being normal to the direction of the axis, each of the second mirror surfaces optically adjacent to at least a corresponding one of the plurality first mirror surfaces for light projected parallel to the axis, each of the plurality of second mirror surfaces separated from the corresponding one of the plurality of first mirror surface a corresponding distance in the direction of the axis; and

projecting light parallel to the axis onto the diffractive optical processor.

53. (New) The method of claim 52, further comprising a step of supporting each of the plurality of first mirror surfaces at its ends.

54. (New) The method of 52, further comprising a step of suspending each of the plurality of second mirror surfaces above the substrate such that each forms a corresponding beam gap.

55. (New) The method of claim 52, wherein the diffractive optical processor has a top surface, and wherein the step of projecting light comprises projecting light onto the diffractive optical processor substantially normally to the top surface.

56. (New) The method of claim 52, wherein the light comprises a wavelength division multiplexed signal, and the method further comprises a step of demultiplexing the light prior to projecting the light onto the diffractive optical processor to separate the wavelength division multiplexed signal into a plurality of sub-signals.

57. (New) The method of claim 56, wherein the step of demultiplexing the light comprises diffractively demultiplexing the light.

58. (New) The method of claim 57, further comprising a step of diffracting at least one of the sub-signals using the diffractive optical processor.

59. (New) The method of claim 58, wherein the step of diffracting at least one of the sub-signals using the diffractive optical processor comprises substantially equalizing the sub-signals.

60. (New) The method of claim 58, wherein the step of diffracting at least one of the sub-signals using the diffractive optical processor comprises dropping a sub-signal from a main pathway.